# GREENHECK

# SMD-302

## Smoke Dampers

***Steel Airfoil Blades***

***UL 555S Leakage Class II***

## Application

Model SMD-302 is a leakage rated smoke damper with extremely low leakage. The SMD-302 serves the function of both a control damper and smoke damper. High strength airfoil blades insure lowest resistance to airflow in HVAC systems with velocities to 3000 fpm (15.2m/s) and 4 in. wg (1.0 kPa) Model SMD-302 may be installed vertically (with blades running horizontal) or horizontally and is rated for airflow and leakage in either direction.

Model SMD-302 meets the requirements for smoke dampers established by:

**National Fire Protection Association**
NFPA Standards 92A, 92B, 101 & 105

**IBC International Building Codes**

**New York City** (MEA listing #260-91-M)

**CSFM California State Fire Marshal**
Leakage (Smoke) Damper Listing (#2330-0981:104)

## UL555S Leakage Rating

| | |
|---|---|
| **Leakage Class:** | II |
| **Operational Rating** | |
| **Maximum Velocity:** | 3000 fpm (15.2 m/s) |
| **Maximum Pressure:** | 4 in. wg (1 kPa) |
| **Maximum Temperature:** | 350ºF (177ºC) depending on the actuator |

**"UL CLASSIFIED (see complete marking on product)"**
**"UL CLASSIFIED to Canadian safety standards (see complete marking on product)"**
Standard 555S (Listing #R13317)

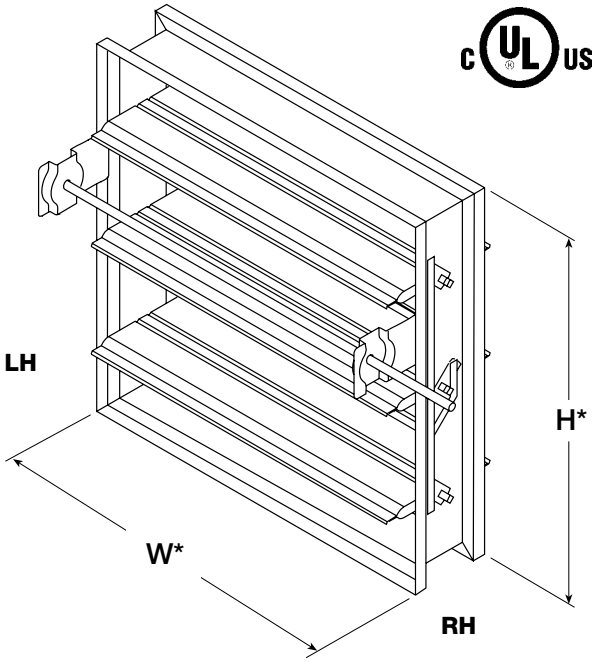
## Standard Construction

| | |
|---|---|
| **Frame:** | 5 in. x 1 in. (127mm x 25mm) galvanized steel hat channel with reinforced corners. A low profile head and sill are used on sizes less than 17 in. (432mm) high to maximize free area and performance. |
| **Blades:** | Double skin airfoil shape of galvanized steel with full length structural reinforcement. 14 ga. (2 mm) equivalent thickness. |
| **Seals:** | Extruded silicone rubber blade seals. Flexible stainless steel jamb seals. |
| **Linkage:** | Concealed in jamb. |
| **Axles:** | 1/2 in. (13mm) dia. plated steel. |
| **Bearings:** | Bronze sleeve type. |

Greenheck Fan Corporation certifies that the model SMD-302 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to air performance ratings only.

## Size Limitations:

| | |
|---|---|
| **Minimum Size:** | 8 in. W x 6 in. H (203mm W x 152mm H) |
| **Maximum Size:** | |
| Single Section: | 32 in. W x 50 in. H (813mm W x 1270mm H) |
| Multiple Section; | 128 in. W x 100 in. H (3251mm W x 2540mm H) or 256 in. W x 50 in. H (6502mm W x 1270mm H) |




*W&H dimensions furnished approximately 1/4 in. (6mm) undersize. Right hand drive is shown. Left hand drive is available upon request. Damper also may be rotated 180° in the field for opposite side drive.
(Add sleeve thickness for overall sleeved damper dimension)

## Optional Features:

- Galvanized steel sleeves.
- Stainless steel bearings
- OCI (Open closed indication switches)
- Electric or pneumatic actuators to accomplish smoke management and system functions.
- Transitions (R, C, O)
- POC retaining angles
- Momentary Switch
- Smoke detectors
- Sealed transitions and sleeves

**Installation instructions available at www.greenheck.com**

# Pressure Drop Data SMD-302

This pressure drop testing was conducted in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent standard air at a density of .075 lb/ft$^3$ (1.201 kg/m$^3$).

Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

## AMCA Test Figures

**Figure 5.3** Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

**Figure 5.2** Illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than Figure 5.5 because entrance losses are minimized by a straight duct run upstream of the damper.

**Figure 5.5** Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

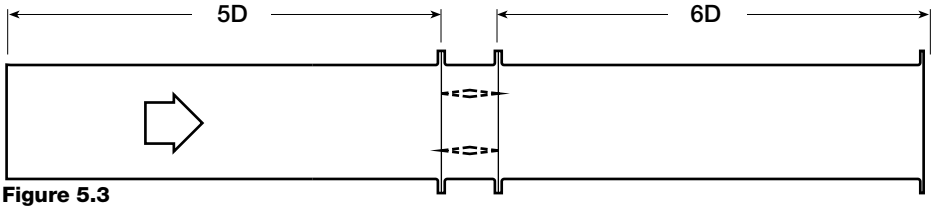
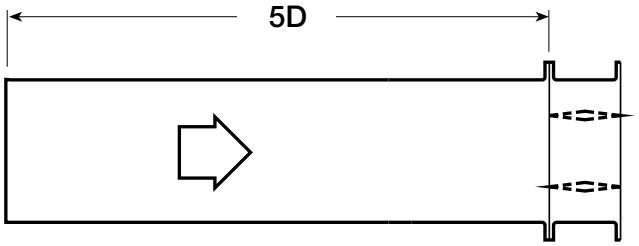



Figure 5.3




$$D \sqrt{\frac{4\,(W)\,(H)}{3.14}}$$

Figure 5.2

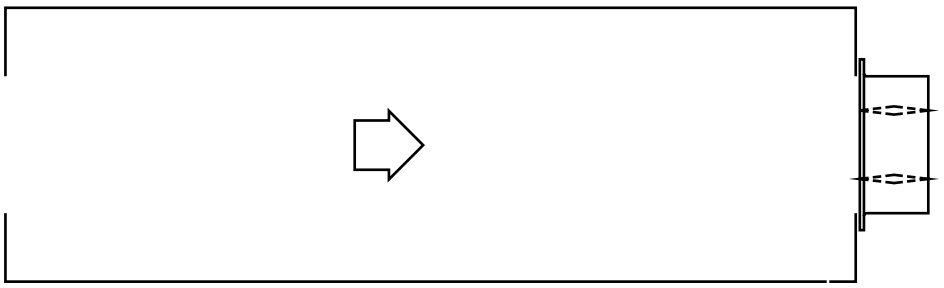
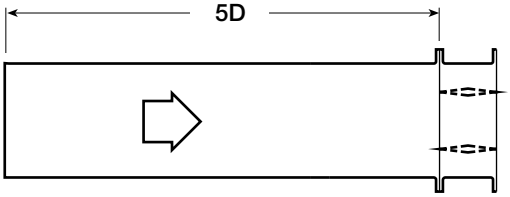


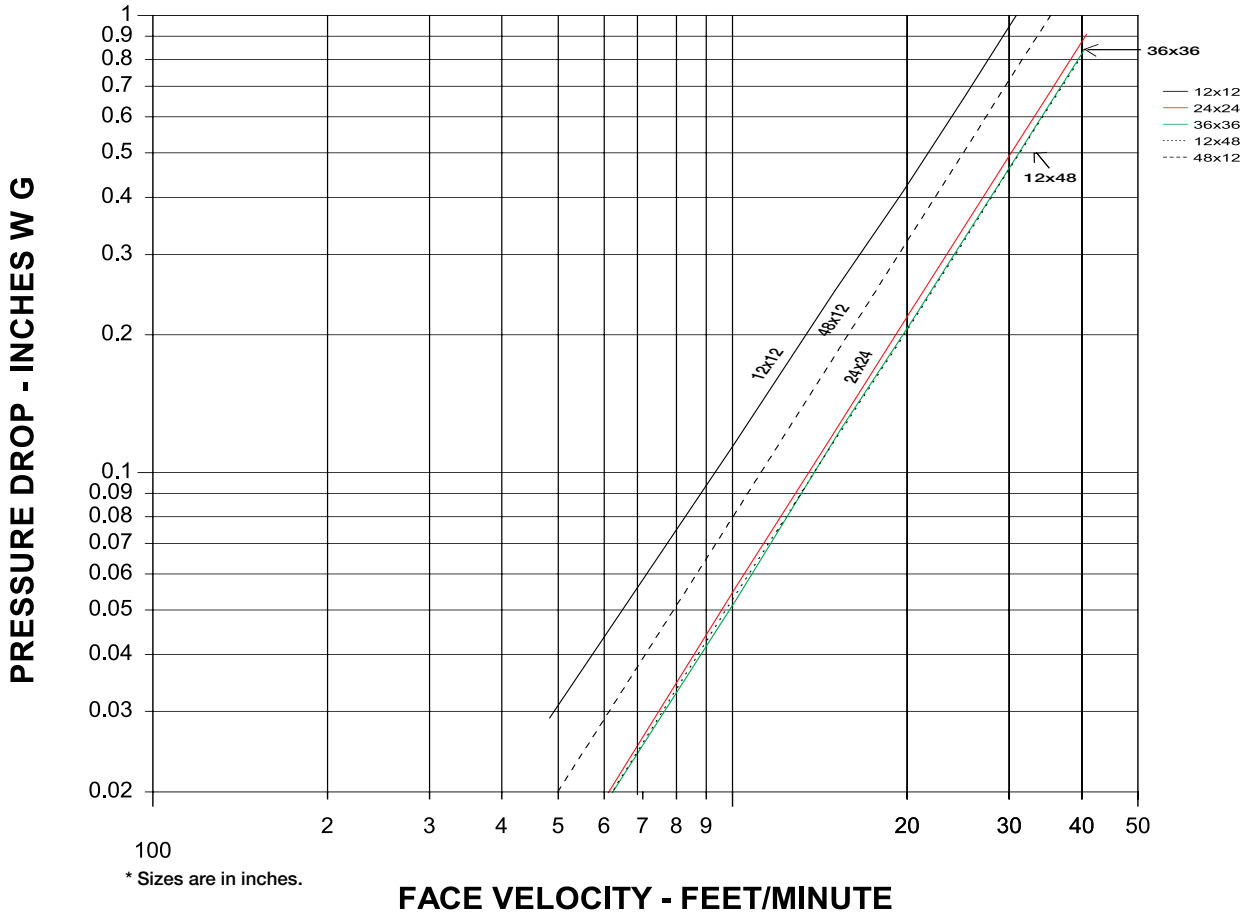
Figure 5.5

# AMCA 5.2 Pressure Drop

# SMD-302




## VELOCITY VS. PRESSURE DROP




* Sizes are in inches.

## FACE VELOCITY - FEET/MINUTE

## AMCA FIG. 5.2

12 in. x 12 in. (305mm x 305mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.03 |
| 1000 | 0.12 |
| 1500 | 0.26 |
| 2000 | 0.46 |
| 2500 | 0.72 |
| 3000 | 1.04 |
| 3500 | 1.41 |
| 4000 | 1.84 |

24 in. x 24 in. (610mm x 610mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.01 |
| 1000 | 0.06 |
| 1500 | 0.12 |
| 2000 | 0.22 |
| 2500 | 0.34 |
| 3000 | 0.49 |
| 3500 | 0.67 |
| 4000 | 0.87 |

36in. x 36 in. (914mm x 914mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.01 |
| 1000 | 0.06 |
| 1500 | 0.12 |
| 2000 | 0.22 |
| 2500 | 0.34 |
| 3000 | 0.49 |
| 3500 | 0.67 |
| 4000 | 0.88 |

12in. X 48 in. (305mm x 1219mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.01 |
| 1000 | 0.05 |
| 1500 | 0.12 |
| 2000 | 0.21 |
| 2500 | 0.33 |
| 3000 | 0.48 |
| 3500 | 0.65 |
| 4000 | 0.85 |

48 in. x 12 in. (1219mm x 305mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.02 |
| 1000 | 0.08 |
| 1500 | 0.18 |
| 2000 | 0.33 |
| 2500 | 0.51 |
| 3000 | 0.74 |
| 3500 | 1.00 |
| 4000 | 1.31 |

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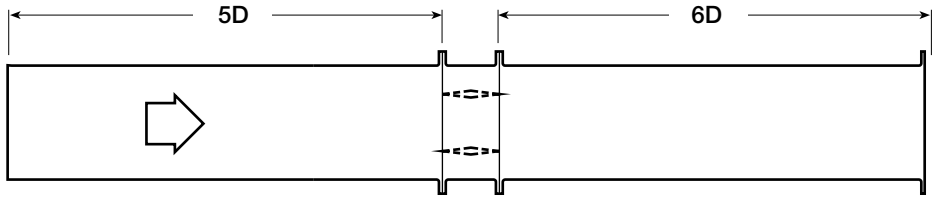
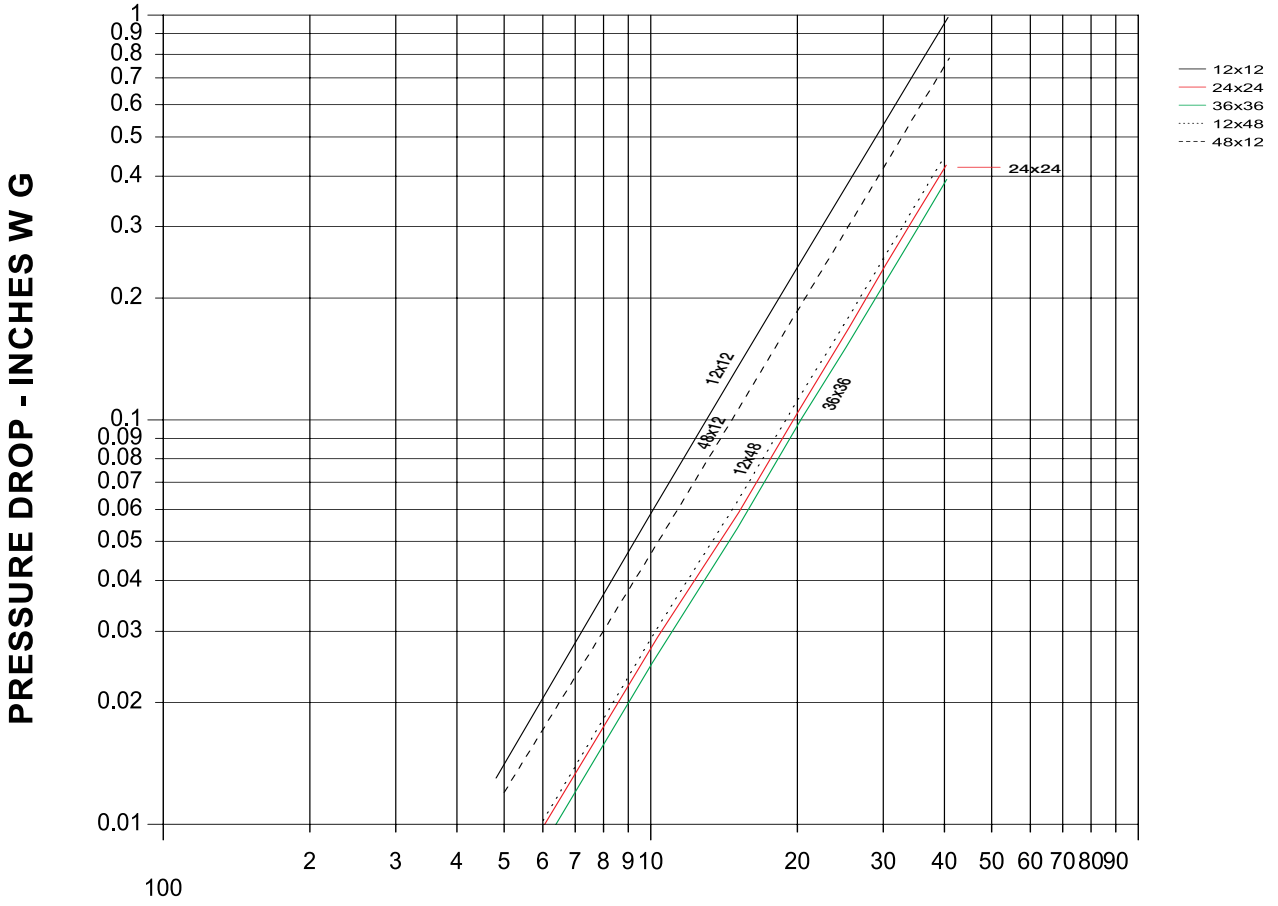
# AMCA 5.3 Pressure Drop SMD-302




## VELOCITY VS. PRESSURE DROP




* Sizes are in inches.

## FACE VELOCITY - FEET/MINUTE

## AMCA FIG. 5.3

12 in. x 12 in. (305mm x 305mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.01 |
| 1000 | 0.06 |
| 1500 | 0.13 |
| 2000 | 0.23 |
| 2500 | 0.37 |
| 3000 | 0.53 |
| 3500 | 0.73 |
| 4000 | 0.95 |

24 in. x 24 in. (610mm x 610mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.01 |
| 1000 | 0.02 |
| 1500 | 0.06 |
| 2000 | 0.10 |
| 2500 | 0.16 |
| 3000 | 0.23 |
| 3500 | 0.32 |
| 4000 | 0.42 |

36in. x 36 in. (914mm x 914mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.01 |
| 1000 | 0.02 |
| 1500 | 0.05 |
| 2000 | 0.09 |
| 2500 | 0.14 |
| 3000 | 0.21 |
| 3500 | 0.29 |
| 4000 | 0.38 |

12in. X 48 in. (305mm x 1219mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.01 |
| 1000 | 0.02 |
| 1500 | 0.06 |
| 2000 | 0.10 |
| 2500 | 0.16 |
| 3000 | 0.24 |
| 3500 | 0.33 |
| 4000 | 0.43 |

48 in. x 12 in. (1219mm x 305mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.01 |
| 1000 | 0.04 |
| 1500 | 0.10 |
| 2000 | 0.18 |
| 2500 | 0.29 |
| 3000 | 0.42 |
| 3500 | 0.57 |
| 4000 | 0.74 |

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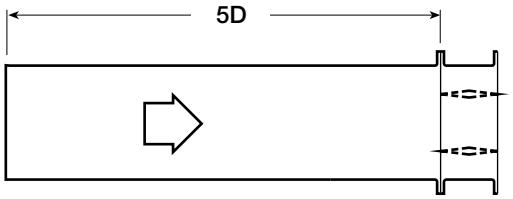
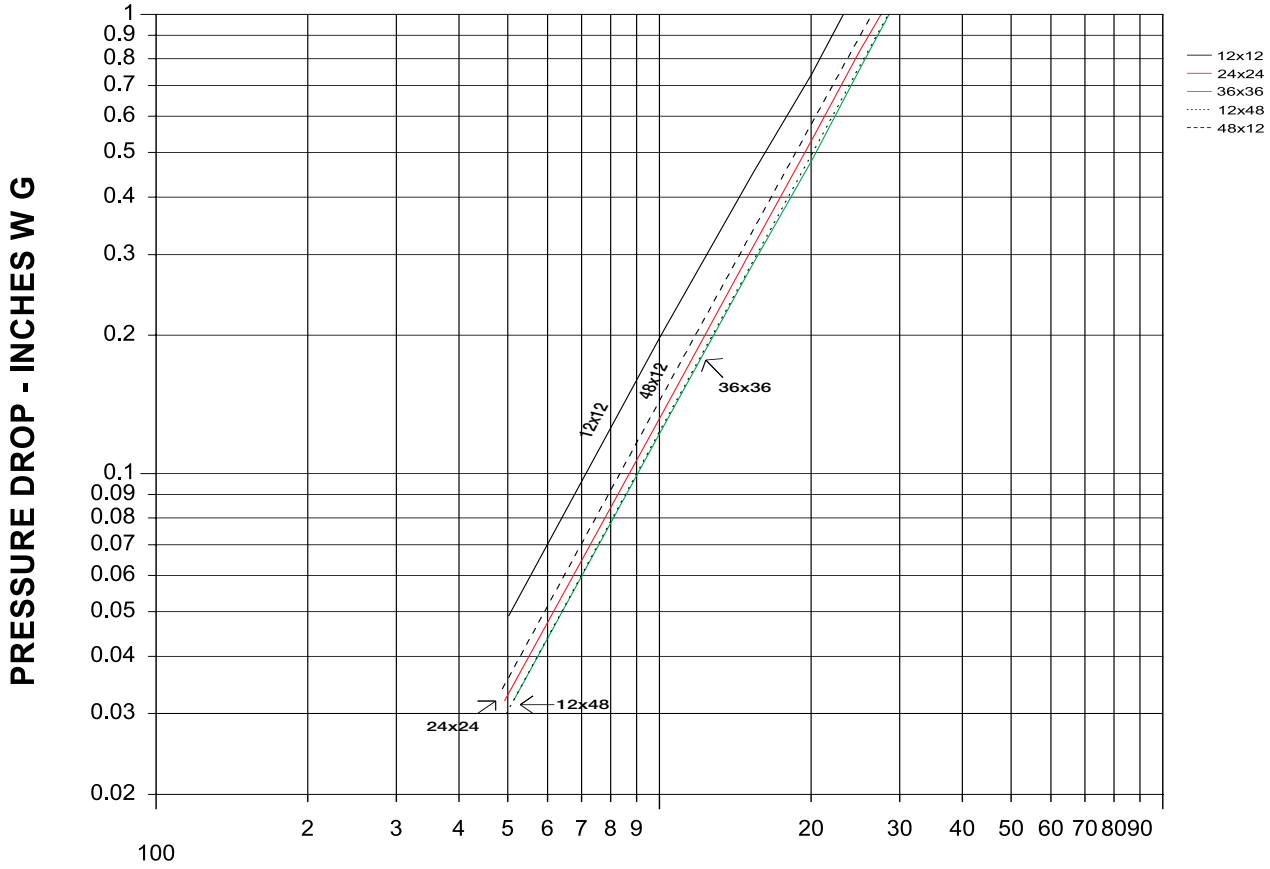
# AMCA 5.5 Pressure Drop SMD-302




## VELOCITY VS. PRESSURE DROP




**FACE VELOCITY - FEET/MINUTE**
**AMCA FIG. 5.5**

12 in. x 12 in. (305mm x 305mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.04 |
| 1000 | 0.18 |
| 1500 | 0.42 |
| 2000 | 0.75 |
| 2500 | 1.17 |
| 3000 | 1.68 |
| 3500 | 2.29 |
| 4000 | 2.09 |

24 in. x 24 in. (610mm x 610mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.03 |
| 1000 | 0.13 |
| 1500 | 0.29 |
| 2000 | 0.52 |
| 2500 | 0.81 |
| 3000 | 1.17 |
| 3500 | 1.60 |
| 4000 | 2.14 |

36in. x 36 in. (914mm x 914mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.03 |
| 1000 | 0.12 |
| 1500 | 0.27 |
| 2000 | 0.48 |
| 2500 | 0.75 |
| 3000 | 1.08 |
| 3500 | 1.48 |
| 4000 | 1.93 |

12in. X 48 in. (305mm x 1219mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.03 |
| 1000 | 0.12 |
| 1500 | 0.27 |
| 2000 | 0.49 |
| 2500 | 0.77 |
| 3000 | 1.11 |
| 3500 | 1.51 |
| 4000 | 1.97 |

48 in. x 12 in. (1219mm x 305mm)

| Velocity (fpm) | Pressure Drop (in. wg) |
|---|---|
| 500 | 0.03 |
| 1000 | 0.14 |
| 1500 | 0.32 |
| 2000 | 0.57 |
| 2500 | 0.89 |
| 3000 | 1.28 |
| 3500 | 1.75 |
| 4000 | 2.29 |

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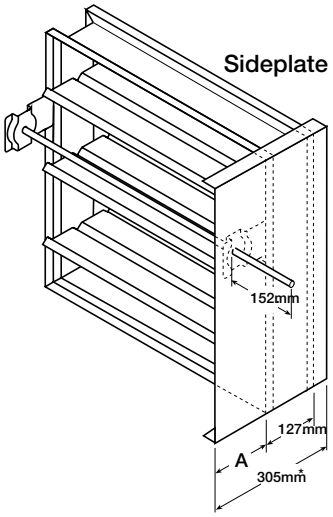
# Application Data

## Damper Sideplate and Sleeve Dimensional Data

The drawings below illustrate the factory standard sideplate and sleeve mountings for the SMD-302. The standard "A" dimensions listed in the table provide adequate space for the mounting of actuators and controls.

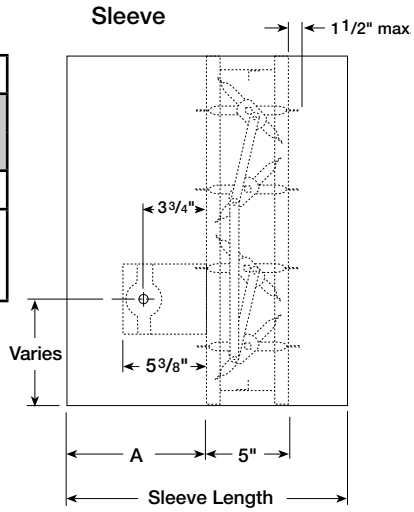
If space constraints are a problem the "A" dimension can be varied between 5 3/8 in. (136mm) and 12 in. (305mm).

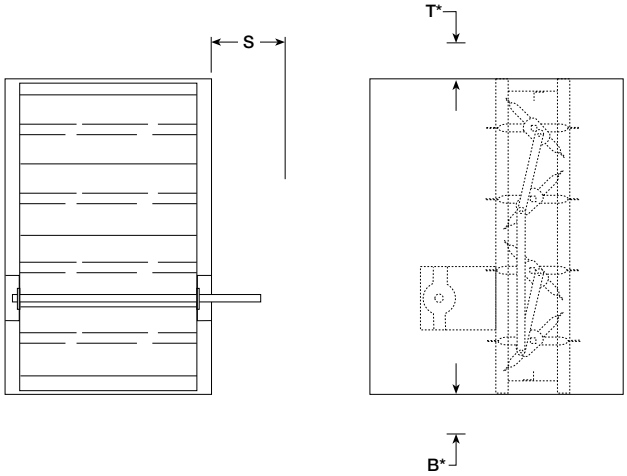



| in. (mm) | "A" Dimension | | |
|---|---|---|---|
| | Sleeve | | Sideplate |
| | Standard | Maximum | |
| All Dampers* | 7 3/16 (183) | 12 (305) | 6 3/16 (157) |
| When height is 11 in. (279) or less with OCI | 11 3/16 (284) | 12 (305) | 10 3/16 (259) |

*With the exception of dampers 11 in. (279mm) high or less (12 in. (305mm)high or less if width is greater than 64 in. (1625mm)) with OCI option.

** On dampers 11 in. (279mm) high or less (12 in. (305mm)high or less if width is greater than 64 in. (1625mm)) with OCI option, sideplate is 16 in. (406mm)




## Space Envelopes Required for Actuators and Accessories

Externally mounted actuators always require space outside of the damper sideplate or sleeve. The “S” dimension illustrates the clearance required for various available actuators.

On dampers less than 18 in. (457mm) high, actuators may also require clearances above and/or below the sideplate or sleeve. “B” and “T” dimensions are worst case clearance requirements for some dampers less than 18 in. (457mm) high. All damper sizes under 18 in. (457mm) high do not require these worst case clearances. If space availability above or below the damper sleeve is limited, each damper size should be individually evaluated.

| Actuator Type/Model | B* | T* | S |
|---|---|---|---|
| | With OCI | With OCI | |
| **120 Volt AC** | | | |
| ML4XXX Series Honeywell | 5 1/4 in. (133mm) | 3/4 in. (19mm) | 6 in. (152mm) |
| MS4XXX Series Honeywell | 6 in. (152mm) | 3/8 in. (10mm) | 6 in. (152mm) |
| MS4120 Series Honeywell | 6 in. (152mm) | 3/8 in. (10mm) | 6 in. (152mm) |
| **24 Volt AC** | | | |
| ML8XXX Series Honeywell | 5 1/4 in. (133mm) | 3/4 in. (19mm) | 6 in. (152mm) |
| MS8XXX Series Honeywell | 6 in. (152mm) | 3/8 in. (10mm) | 6 in. (152mm) |
| MS8120 Series Honeywell | 6 in. (152mm) | 3/8 in. (10mm) | 6 in. (152mm) |
| **Pneumatic (psi)** | | | |
| 331-4551 Siemens | 1 in. (25mm) | 6 1/4 in. (159mm) | 6 1/2 in. (165mm) |
| 331-2976 Siemens | 2 3/8 in. (60mm) | 12 1/8 in. (308mm) | 9 1/4 in. (235mm) |
| MK2-7121 Invensys | 3 3/4 in. (95mm) | 16 1/2 in. (419mm) | 10 in. (254mm) |

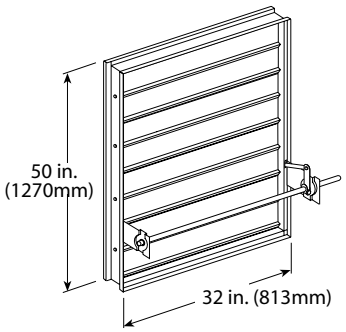
* For dampers 18 in. (457mm) or more in height these dimensions are 0 in. .

# Damper Sizing Information

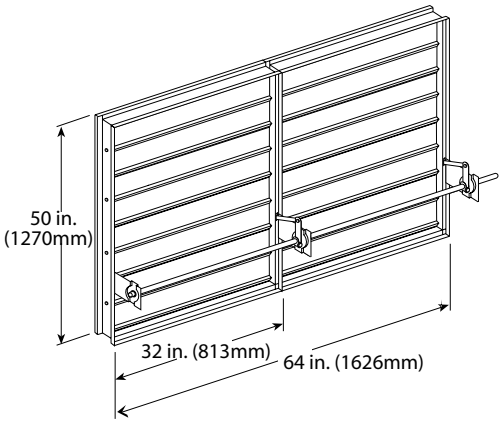
Dampers larger than maximum single section size are supplied as a factory assembly of two or more sections of equal size.

The following figures show damper sections and assemblies that have been qualified for operation with a single actuator. Larger sizes can be accommodated using multiples of these assembles.

Single Section

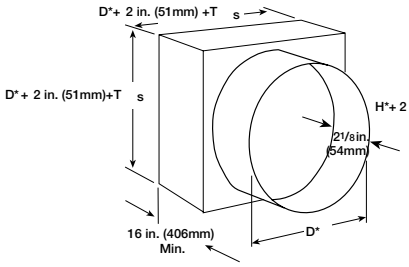



Double Section

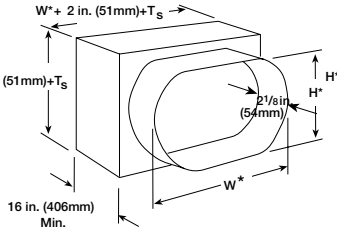



## Transitioned Damper Dimensions

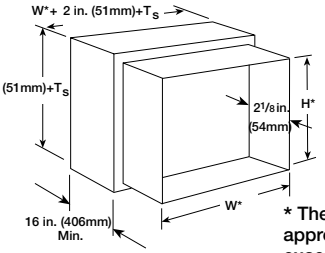
When a fire/smoke damper is being used in conjunction with round or oval ductwork, the SMD-302 can be supplied in a factory sleeve with round or oval transitions on both ends of the sleeve. Dampers should be ordered to the duct dimensions. Drawings below show overall damper size.




TYPE R




TYPE O




TYPE C

* These dimensions are furnished approximately 1/4 in. (6mm) undersize, except round and oval dimensions which are approximately 1/8 in. (3mm) undersize.

$T_S$ = (2)(Sleeve Thickness)

## Specifications

Smoke Dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall meet the requirements of NFPA 92A, 92B, 101 & 105 and further shall be tested, rated and labeled in accordance with the latest edition of UL Standard 555S. Smoke dampers shall be of low leakage design qualified to UL 555S Leakage Class II.

Each damper/actuator combination shall have a UL555S elevated temperature rating of 250°F (121° C) minimum and shall be rated to operate at maximum design air flow at its installed location. Each damper shall be supplied with an appropriate actuator installed by the damper manufacturer at the time of damper fabrication. Damper actuator shall be (specifier select one of the following) electric type for 120 (24 or 230) volt operation or pneumatic type for 25 psi minimum (30 psi maximum) operation.

Damper blades shall be of the double skin airfoil type and shall have an equivalent metal thickness of 14 ga. (2mm) Damper frame shall be galvanized steel formed into a structural hat channel shape with reinforced corners. Bearings shall be sintered bronze sleeve type rotating in extruded holes in the damper frame. Blade edge seals shall be silicone rubber designed to inflate and provide a tighter seal against leakage as pressure on either side of the damper increases. Jamb seals shall be stainless steel compression type. Blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow in either direction or pressure on either side of the damper.

Damper must be rated for mounting vertically (with blades running horizontal) or horizontally and be UL 555S rated for leakage and airflow in either direction through the damper.

The basis of design is Greenheck Model SMD-302.

GREENHECK

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